

IS 10322 (Part 5/Sec 6) : 2013
(Reaffirmed 2018)

भारतीय मानक

प्रदीपक

भाग 5 विवरणात्मक अपेक्षाएँ
अनुभाग 6 हैंड लैम्प

Indian Standard

LUMINAIRES

PART 5 PARTICULAR REQUIREMENTS

SECTION 6 HANDLAMPS

ICS 29.140.40

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BUREAU OF INDIAN STANDARDS
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Price Group 3

FOREWORD

This Indian Standard (Part 5/Sec 6) was adopted by the Bureau of Indian Standards, after the draft finalized by the Illumination Engineering and Luminaires Sectional Committee had been approved by the Electrotechnical Division Council.

This standard covers the requirements of handlamps. This standard covers only the safety requirements.

This standard (Part 5/Sec 6) is one among the series of Indian Standards which deals with luminaires. The other parts and sections are as follows:

Part 1	General requirements
Part 5	Luminaires
(Part 5/Sec 1)	Particular requirements, Sec 1 General purpose luminaires
(Part 5/Sec 2)	Recessed luminaires
(Part 5/Sec 3)	Luminaires for road and street lighting
(Part 5/Sec 4)	Portable general purpose luminaires
(Part 5/Sec 5)	Flood lights
(Part 5/Sec 7)	Lighting chains
(Part 5/Sec 8)	Luminaires for emergency lighting

This standard is to be read in conjunction with IS 10322 (Part 1) : 2010 'Luminaires: Part 1 General requirements and tests'. For the sake of convenience, the clauses of this standard correspond to those of IS 10322 (Part 1), instead of reproducing full text of each clause; reference to relevant clauses of IS 10322 (Part 1) has been given.

This standard is based on IEC 60598-2-8, (1996) (with Amendment 1 and 2) 'Luminaires — Part 2: Particular requirements, Section 8 Handlamps' issued by the International Electrotechnical Commission (IEC).

After the publication of this standard, IS 1415 : 1966 'Specification for electric hand lamps' shall be withdrawn since the requirements given in IS 1415 has been covered in this standard.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Indian Standard***LUMINAIRES****PART 5 PARTICULAR REQUIREMENTS****SECTION 6 HANDLAMPS****1 SCOPE**

This standard (Part 5/Sec 6) specifies requirements for handlamps and similar portable luminaires which are held in the hand, hooked up or resting on a surface for use with electric light sources on supply voltages not exceeding 250 V.

Handlamps which can be fixed to a support by means of a wing screw, clip or magnet, and luminaires intended for inspection of the interior of barrels, are within the scope of this section.

2 REFERENCES

The following standards are necessary adjunct to this standard:

<i>IS No.</i>	<i>Title</i>
9968 (Part 1) : 1988	Elastomer insulated cables: Part 1 For working voltages upto and including 1100 V
10322 (Part 1) : 2013	Luminaires: Part 1 General requirements and tests

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 10322 (Part 1/Sec 1) and the following shall apply.

3.1 Handlamp — A luminaire with a handle and a flexible cable or cord, intended to be moved frequently while connected to the supply.

3.2 Rewirable Handlamp — A handlamp with a Type X or Type Y attachment.

3.3 Non-rewirable Handlamp — A handlamp with a Type Z attachment.

3.4 Sealed Handlamp — A handlamp of which all protective covers are sealed and which makes it impossible to replace the lamp without destroying the handlamp.

4 GENERAL TEST REQUIREMENTS

4.1 The provisions of IS 10322 (Part 1/Sec 0) shall apply together with the requirements of **4.2**. The tests described in each appropriate section of Part 1 shall be carried out in the order listed in this standard.

4.2 The requirements of **0.4.2** of IS 10322

(Part 1/Sec 0) shall not apply.

In general, four samples are necessary for the tests, three of which are subjected to the tests of **13** to **16**, the fourth sample being subjected to the other tests.

All four samples shall be subjected as well to the test for rough service luminaires of **4.13.4** (b) of IS 10322 (Part 1).

For handlamps provided with a rubber protection cover, an additional sample is necessary for the test of **13.1**.

Where a range of similar handlamps is involved, the specified tests are made on a representative complete set from the range. This set shall include handlamps, together with any attachments, which represents the most unfavourable combination.

5 CLASSIFICATION OF LUMINAIRES

Luminaires shall be classified in accordance with the provisions of IS 10322 (Part 1/Sec 2) together with the requirements of **5.1**, **5.2** and **5.3**.

5.1 According to the type of protection against electric shock, handlamps shall be classified as Class II or Class III.

5.2 According to the method of connecting the cable or cord, handlamps shall be classified as:

- a) Rewirable handlamps, or
- b) Non-rewirable handlamps.

5.3 According to the circumstances of use, handlamps shall be classified as rough service luminaires.

6 MARKING

The provisions of IS 10322 (Part 1/Sec 3) shall apply, together with the requirements of **6.1**, **6.2** and **6.3**.

6.1 The symbol for Class II or Class III, the marking for rated voltage of Class III handlamps and the symbol for the degree of protection against dust and moisture shall be on the outside of the handlamp.

The marking for maximum rated wattage shall not be in paint or ink, even when protected by varnish.

Compliance shall be checked by inspection and by the test described in IS 10322 (Part 1/Sec 3).

NOTE — This requirement is met, if the marking is visible from the outside through a translucent cover.

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6.2 The symbol for rough service luminaries is optional for handlamps.

6.3 For handlamps with replaceable lamps and with type X attachment, the method instructing how to open and close the luminaire shall be marked on the protective cover and shall remain visible during and after use.

6.4 BIS Certification Marking

The luminaries may also be marked with the Standard Mark.

6.4.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which the licence for use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

7 CONSTRUCTION

The provision of IS 10322 (Part 1/Sec 4) shall apply, together with the requirements of **7.1** to **7.6**.

7.1 The shell and handle, and other protective covers of handlamps shall be of insulating material.

7.2 The lamp shall be protected against accidental damage by a protective grid, translucent cover or similar protective means. These devices shall be rigidly fixed to the body of the handlamp and it shall not be possible to remove the device by hand.

The protective device shall remain attached to the handlamp during the lamp replacement, for example, by a hinge, chain or equal effective device.

For handlamps for tubular fluorescent lamps, the removal of the protective device shall be so arranged that the opening occurs at the end of the lamp where the lamp holder is connected to the ballast.

If the protective device is of metal, it shall be so positioned or protected by insulation that it is not likely to be inadvertently touched when holding the handle. The distance between the glass of the tungsten filament lamp or the tubular fluorescent lamp or any protective glass and a plane through the outside of two adjacent bars of a protective grid or a protective cover, shall be at least 3 mm.

Suspension hooks, if any, shall be securely fixed to the handlamp.

Compliance is checked by inspection, by measurement and by loading the hook to a weight which is twice the weight of the luminaire, including the total weight of the attached cable, cord, ballast or transformer. The hook shall not deform such that the luminaire slips from

the means of suspension which for testing purposes, is a 1 mm metal bar.

7.3 Handlamps shall not use resistive ballasts or resistive cables to limit the current in discharge lamps.

7.4 Lampholders for tungsten filament lamps shall be locked against rotation by at least two independent means, at least one of which shall be operable only with the aid of a tool. The means of fixing shall not serve to fix any other part.

Compliance shall be checked by inspection and by manual test.

7.5 Ballasts or transformers where connected in the flexible cable or cord shall be at a distance not greater than 1 m from the plug and equipped with a suspension hook.

Compliance shall be checked by inspection, by manual test and by measurement.

7.6 The test for mechanical strength described in **4.13** of IS 10322 (Part 1/Sec 4) does not apply, except the test of **4.13.4** (b) as mentioned in **4.2** of IS 10322 (Part 5/Sec 6). In addition, the mechanical strength shall be checked by the test described in **7.6.1**, if applicable, and by the test described in **7.6.2**.

7.6.1 The grid, translucent covers and protective covers shall be firmly fixed.

Compliance is checked by a pull of 100 N for 1 h, applied to the parts of the body of the handlamp which, when loose, would allow to touch current-carrying parts.

For handlamps containing tubular fluorescent lamps this is likely along its longitudinal axis.

For sealed handlamps, in addition a torque test of 10 Nm shall be applied to the parts which, when loose, would allow to touch current-carrying parts.

The grid or protective covers shall remain in position during and after the test.

7.6.2 The handlamp, fitted with a flexible cable or cord in accordance with the requirements of **11.2** and of suitable length, is subjected to two impact tests in which it is caused to swing against a steel bar which is mounted on a solid wall of brick, stone, concrete or similar material, as shown in Fig. 1.

The bar is of 40 mm × 40 mm × 5 mm right-angle section with the corner rounded to a radius of 5 mm. It is mounted in contact with the wall or, if necessary, in contact with a steel packing block which is in contact with the wall.

The handlamp, without lamp, is suspended by its flexible cable or cord so that the point 'a', indicated in

Fig. 1, rests against the corner of the bar, the point of suspension being 400 mm above the bar. It is then drawn away from the bar in a plane perpendicular to the wall until the cable or cord is horizontal.

The sample is allowed to fall against the bar three times in this way. It is then suspended so that the impact is at the point 'b', and caused to fall similarly three times, followed by three falls against the point 'c'.

After this first test, the sample shall show no damage impairing its safety or further use. The whole of the above test is then repeated but with the point of suspension 1 m above the bar.

After this second test, the sample shall show no damage impairing its safety or further use. The means protecting the lamp against damage shall not have loosened, even if it has become deformed. Breakage of the protective glass of translucent cover, if any, is neglected, if it is not the sole means protecting the lamp against damage.

NOTE — The steel packing block is necessary only if the shape of the handlamp is such that, without it, the handlamp does not hit the bar.

8 CREEPAGE DISTANCE AND CLEARANCE

The provisions of IS 10322 (Part 1/Sec 11) shall apply.

9 PROVISION FOR EARTHING

The provisions of IS 10322 (Part 1/Sec 7) shall not apply.

10 TERMINALS

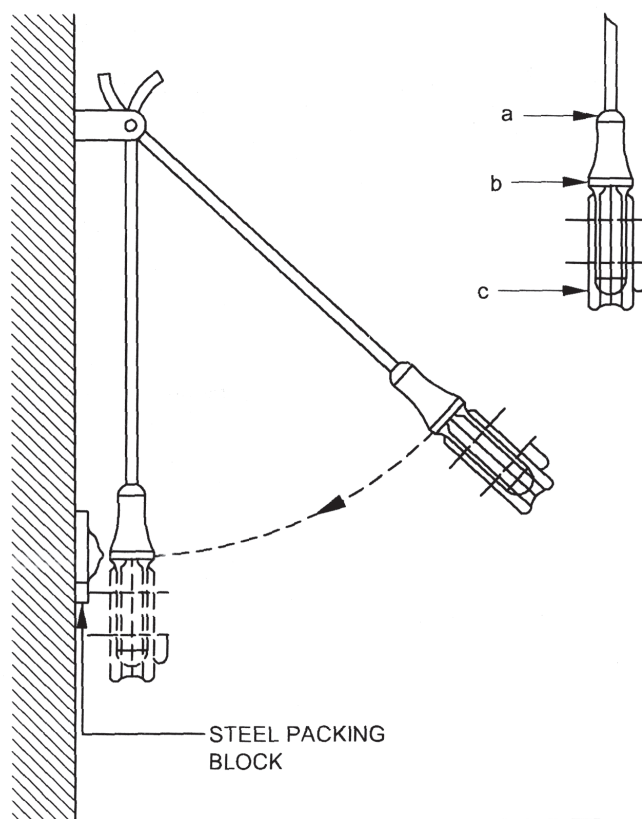
The provisions of IS 10322 (Part 1/Sec 14 and 15) shall apply, together with the requirements of **10.1**.

10.1 Terminals for supply connection shall be suitable for the connection of conductors having nominal cross-sectional areas from 0.75 mm² to 1.5 mm².

Compliance shall be checked by fitting conductors of the smallest and largest cross-sectional areas specified.

11 EXTERNAL AND INTERNAL WIRING

The provisions of IS 10322 (Part 1/Sec 5) shall apply, together with the requirements of **11.1** to **11.6**.



All dimensions in millimetres.

FIG. 1 ARRANGEMENT FOR IMPACT TEST FOR HANDLAMPS

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11.1 Rewirable handlamps shall be equipped with Type X attachment.

Non-rewirable handlamps shall be equipped with Type Y or Type Z attachment.

Handlamps shall not be provided with socket-outlets.

Handlamps other than ordinary shall not be provided with appliance inlets. Where ordinary handlamps are provided with appliance inlets, they shall have mechanical locking.

Compliance shall be checked by inspection.

11.2 Flexible cables or cords shall be not lighter than the following types specified in IS 9968 (Part 1).

Flexible cable and cords shall be polychloroprene sheathed.

The nominal cross-sectional area of the conductors shall be not less than,

- a) 0.75 mm² for ordinary handlamps; and
- b) 1 mm² for other handlamps.

Compliance shall be checked by inspection.

11.3 Handlamps shall have only one cable entry.

Compliance shall be checked by inspection.

11.4 The requirements of **5.2.7** and **5.2.8** of IS 10322 (Part 1/Sec 5) shall not apply.

Flexible cable and cords shall be protected against excessive bending at the inlet opening of the handlamp and the plug-ballast/transformer (where applicable) by means of a cord guard of insulating material or a suitably shaped inlet opening.

For cord guards,

- a) they shall not be integral with the flexible cable or cord, for rewirable handlamps;
- b) they shall be fixed in a reliable manner so that they cannot readily be lost;
- c) they shall project outside the handlamp for a distance of at least 25 mm beyond the inlet opening; and
- d) they shall have adequate mechanical strength and elasticity.

Compliance shall be checked by inspection, by measurement and by the tests described in **11.4.1**.

11.4.1 For non-rewirable handlamps and for rewirable handlamps, the part of the handlamp carrying the cable entry is fixed to the oscillating member of an apparatus similar to that shown in Fig. 2, so that when this is at the middle of its travel the axis of the flexible cable or cord, where it enters the sample, is vertical and passes through the axis of oscillation.

The cable or cord is loaded with a weight such that the force applied is 20 N.

A current, the value of which is derived from the maximum rated wattage and the rated voltage, is passed through the conductors, the voltage between the contacts of the lampholder being equal to the rated voltage.

The oscillating member is moved backwards and forwards through an angle of 90° (45° on either side of the vertical), the number of flexings being 20 000 and the rate of flexing 60/min.

After the test, not more than 50 percent of the strands in a conductor shall be broken, and the cord or cable shall be subjected to, and shall satisfy, the insulation resistance and high-voltage tests specified in IS 10322 (Part 1/Sec 10).

NOTE — A flexing is one movement, either backwards or forwards.

11.5 For rewirable handlamps, the test of **5.2.10.1** of IS 10322 (Part 1/Sec 5) is made without a cord guard, gland or similar device in position. Non-rewirable handlamps are tested as delivered.

Glands shall not be used as cord anchorage.

Compliance shall be checked by inspection.

11.6 Non-detachable flexible cables and cords shall have a length of at least 5 m.

Compliance shall be checked by measuring the length of the cable or cord between the point where the cable or cord, or cord guard, enters the handlamp, and the entry to the plug.

12 PROTECTION AGAINST ELECTRIC SHOCK

The provisions of IS 10322 (Part 1/Sec 8) shall apply, together with the requirements of **12.1**.

12.1 It shall not be possible to remove by hand parts which prevent contact with ES or BC lamp caps.

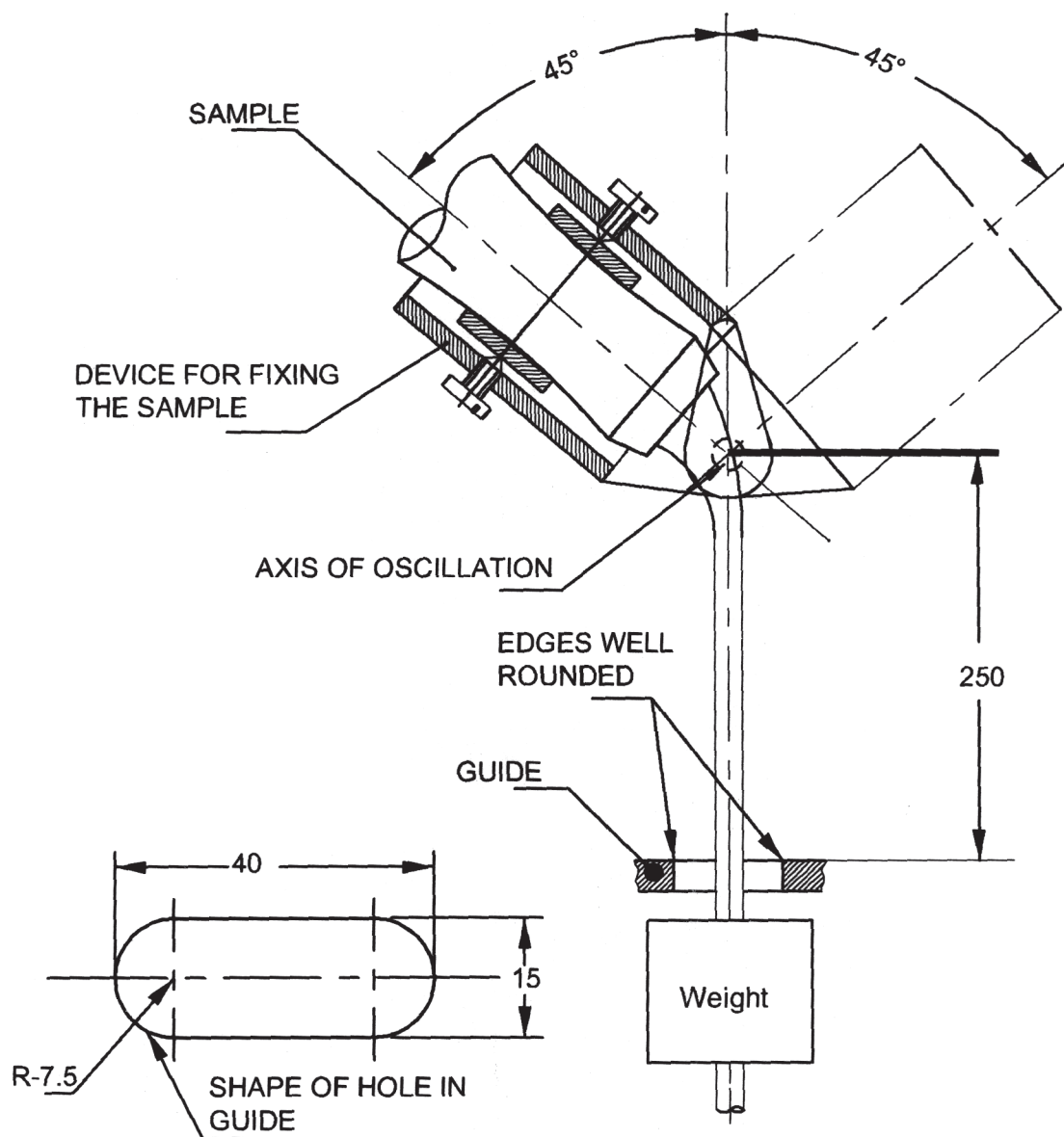
For handlamps with tungsten filament lamps, when protection against electric shock is checked the protective grid and the protective glass are removed unless they are integral with the body of the handlamp.

Compliance shall be checked by inspection and by manual test.

13 ENDURANCE TESTS AND THERMAL TESTS

The provisions of IS 10322 (Part 1/Sec 12) shall apply, together with the requirements of **13.1** to **13.3**.

13.1 For handlamps and ballasts with external parts the deterioration of which impairs the safety of the handlamp, compliance shall be checked by the following endurance test in addition to the test of **12.3.1** of IS 10322 (Part 1/Sec 12).



All dimensions in millimetres.

FIG. 2 APPARATUS FOR FLEXING TEST

Luminaires with an IP classification greater than IP20 shall be subjected to the relevant tests of **12.4**, **12.5** and **12.6** of IS 10322 (Part 1/Sec 12) after the test(s) of **9.2** but before the test(s) of **9.3** of IS 10322 (Part 1/Sec 9) specified in **14** of IS 10322 (Part 1).

Rubber handlamps and rubber cases of independent ballasts are aged in an atmosphere having the composition and pressure of the ambient air, by suspending them freely in a heating cabinet, ventilated by natural circulation.

The sample is kept in the cabinet for 10 days (240 h) at a temperature of $70 \pm 2^\circ\text{C}$ or at a temperature which is $30 \pm 2^\circ\text{C}$ in excess of the highest temperature

obtained for the rubber during the test of **12.4.1** of IS 10322 (Part 1/Sec 12), whichever is the higher.

During the test, the rubber parts shall not undergo any change which could cause the handlamp to become unsafe.

After the above test the luminaire shall withstand an electric strength test as specified in **10.2.2** of IS 10322 (Part 1), but with the test voltage reduced by 500 V.

NOTES

1 This test is made on a separate sample.

2 The use of an electrically heated cabinet is recommended. Natural circulation may be provided by holes in the wall of the cabinet.

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13.2 The thermal tests representing normal operation and abnormal operation, of **12.4** and **12.5** of IS 10322 (Part 1/Sec 12), are made with the handlamp and independent ballast, if any, either placed on a dull black painted wooden floor or suspended so that they rest against a dull black painted wooded wall, whichever is the more unfavourable.

NOTE — According to this requirement the ballast, if any, is not tested within a test hood.

13.3 The limiting temperature of 70°C for natural rubber in Table 12.2 of IS 10322 (Part 1/Sec 12) does not apply to non-protective parts. The test of **13.1** is sufficient.

14 RESISTANCE TO DUST AND MOISTURE

The provisions of IS 10322 (Part 1/Sec 9) shall apply, together with the requirements of **14.1**.

For luminaires with an IP classification greater than IP20 the order of the tests specified in IS 10322 (Part 1/Sec 9) shall be as specified in **13**.

14.1 Protective glasses, translucent covers and similar parts are removed before the humidity treatment, even if their removal requires the use of a tool, unless they are integral with the body of the handlamp.

15 INSULATION RESISTANCE AND ELECTRIC STRENGTH

The provisions of IS 10322 (Part 1/Sec 10) shall apply.

16 RESISTANCE TO HEAT, FIRE AND TRACKING

The provisions of IS 10322 (Part 1/Sec 13) shall apply, together with the requirements of **16.1**.

16.1 For handlamps having a handle or shell of flexible material, such as rubber or polychloroprene, compliance shall be checked by the following test.

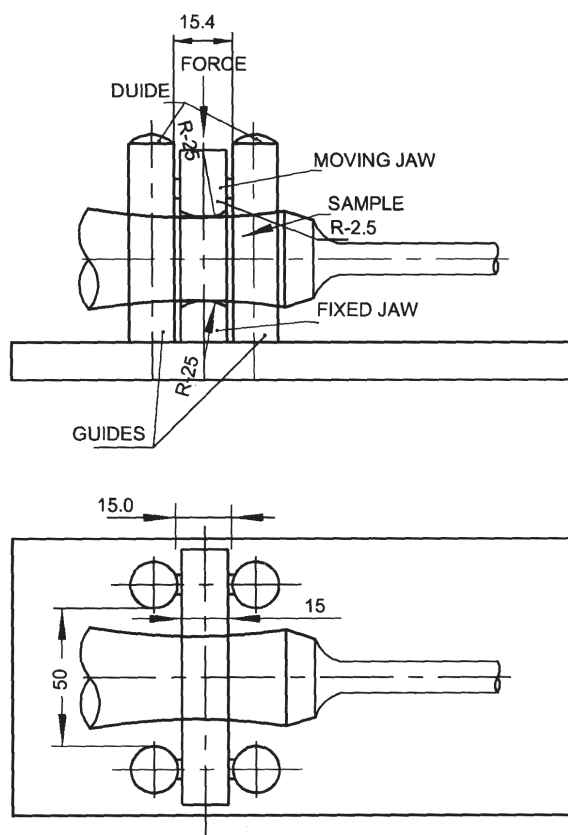
The parts of the handlamp which are gripped in normal use are subjected to a pressure test in an apparatus similar to that shown in Fig. 3, the test being made in a heating cabinet maintained at a temperature of $100 \pm 2^\circ\text{C}$.

The sample is clamped between steel jaws, having a cylindrical face of 25 mm radius, a width of 15 mm and a length of 50 mm. The corners are rounded with a radius of 2.5 mm.

The sample is clamped in such a way that the jaws press against it in the area where it is gripped in normal use, the centre line of the jaws coinciding as nearly as possible with the centre of this area.

The force applied through the jaws is 100 N.

After 1 h, the jaws are removed and the sample shall show no damage.



All dimensions in millimetres.

FIG. 3 CRUSH TEST APPARATUS

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Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards : Monthly Additions'.

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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